Hidden Critters
Lesson Five - The Giant Barrel Sponge

Barrel Sponge with shrimp and squirrel fish by Jacqui Stanley 2010

Activity Summary:
In this lesson, students will learn that sponges are filter feeders. They are composed of cells that pump water through the wall of the sponge, trapping microscopic plankton for food. Barrel sponges are the largest of all the sponges and so they make great homes for a variety of creatures, such as fish and shrimps.
Students will discuss how the barrel sponge is constructed, and then create their own interpretation of a giant barrel sponge.

Grade Level: 3 – 6

Time Frame: One class period

Materials:

- Paper suitable for painting or crayons
- Crayons
- Pencils
- Sponges from the supermarket

Learning Objectives:
Students will be able to:
Art:

Create artworks, using a variety of colors, forms and lines
Identify colors, textures, forms, and subjects in the environment
Identify connections between the visual arts and other disciplines in the curriculum

Science:

Communicate observations and provide reasons for explanations
Use form to explain function
Use function to explain form

Vocabulary:

ART:

SHAPE – There are two types of shape:
Geometric or man-made – examples are a window, a white board, a desk top
Organic or Natural shapes – examples include leaves, trees, clouds, animals
BALANCE - a design principle concerned with the arrangement of one or more elements in a work of art so that they appear symmetrical (even) or asymmetrical (uneven) in design and proportion

SCIENCE:

FILTER FEEDER - an organism that feeds by pumping large volumes of water to consume material in suspension, such as phytoplankton

SPONGE – a marine animal of the phylum Porifera, having a porous structure and usually a calcareous internal skeleton

POROUS - to allow water to pass through

CALCAREOUS – made of calcium carbonate

Preparation

Images of Barrel Sponges

Projected image of Giant Barrel Sponge painting – see start of lesson plan

A bath sponge or a kitchen sponge

Procedure

1) You might have seen a sponge in your kitchen at home or in the bathroom. We are going to talk about real sponges that grow in the ocean.
2) Pass around examples of sponges. The kitchen sponges do not grow in the ocean – they are man made, but they work in the same way. Look closely at the cells or small air pockets in the sponge, the barrel sponge has the same cells.
3) Look at the painting. You will notice that the painting is not complete. The sponge at the front of the painting is ready for you to create the walls of the sponge.
4) Look carefully at the shapes in the painting – they are organic shapes.
5) Look carefully at the colors and the hue of the colors. To give your image a realistic look, you want to think about some different hues by adding some lighter paint and think about where the light is coming from in your picture. If the light is overhead then the top of your sponge will be lighter than the bottom. If the light in your picture is coming from the front, then you should have lighter colors at the front of your sponge.
6) The sides of the sponge has ragged rib-like sides, so remember to paint or draw the sides of the sponge with lines that are dark and light. This will give the impression that the sponge has lots of crevices and so provides homes for many small creatures.
7) These sponges can grow to be over 100 years old. A sponge that is that old could hold a SCUBA diver inside, however we would not want to do that as the sponges are very delicate and break easily. Sponges only grow about half an inch each year!
   If you were diving, sometimes it is possible to carefully place your hand inside the sponge and feel the water being pushed through it as the sponge filters the water for its food.
8) The shape of the sponge is important as a habitat for small fishes and other creatures.
9) Think about how the inside of the sponge will be a dark, round shape. Then, add in the outside of your sponge. It will be lighter in color as it has more light shining on it.

10) Take some white and mix it with the color you have chosen for your sponge. Paint or draw the top rim of the sponge. Then add a bigger barrel-like shape for the body of the sponge. You can fill in the crevices and rib like structures that run down the sides of the sponge. You might want to make them a different color from the background of your sponge so they stand out.
11) Now, think about what creatures might live inside your sponge, and why?
12) You can add in other sponges and even other marine life to create a fabulous undersea sponge garden!
13) Finally, think about the creatures we have looked at already in the "What Is It" series. Do you think any of them could use the sponge for protection? Why?

Education Standards

National Education Standards	**ART : NA-VA.K-4.1 UNDERSTANDING AND APPLYING MEDIA, TECHNIQUES, AND PROCESSES** **NA-VA.K-4.2 USING KNOWLEDGE OF STRUCTURES AND FUNCTIONS** **SCIENCE:** E.U.5 Form and function a. Form–Form is the shape of an object. The goal is for students to use form to explain function. b.Function–Function is the normal or characteristic action of anything. The goal is for students to use function to explain form. **ENGLISH/LANGUAGE ARTS** **NCTE/IRA Standards** 3) Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes. **11)** Students participate as knowledgeable, reflective, creative, and critical members of a variety of literacy communities.
Ocean Literacy Principles	The Ocean supports a great diversity of life and ecosystems

Evaluation

Students create their version of the Giant Barrel Sponge and clearly show that they understand that this organism grows on the ocean bottom and does not move, but does provide shelter for a variety of other marine life.

Extension
Students research the Giant Barrel Sponge and create a diagram of how the sponge filters sea water to obtain its food.

Resources
http://people.uncw.edu/pawlikj/xmuta.html
This site has some good images of the Giant Barrel Sponge, as well as information about bleaching and current research about the Giant Barrel Sponge.

Acknowledgements:

This lesson was developed by NOAA's Office of National Marine Sanctuaries.

This lesson was developed for NOAA National Marine Sanctuary Programs by Jacqui Stanley from Young Audiences Arts for Learning.